CLAIMS

What is claimed is:

1. A variable capacity rotary compressor, comprising:

a hermetic casing;

a housing disposed in the hermetic casing and including first and second compressing chambers having different capacities;

a rotating shaft rotatably disposed in the first and second compressing chambers;

first and second eccentric units mounted on an outer surface of the rotating shaft in the first and second compressing chambers, respectively, the first and second eccentric units being operated in opposite manners such that when either the first or second eccentric unit is locked in an eccentric state to perform a compressing operation, the other eccentric unit is released from the eccentric state to release the compressing operation;

first and second roller pistons fitted on outer surfaces of the first and second eccentric units, respectively;

first and second vanes provided in the first and second compressing chambers to be radially moved while being in contact with the first and second roller pistons, respectively; and

a pressure control unit to allow a discharging pressure to be applied to either the first or second compressing chamber, where an idle rotating operation is performed.

2. The variable capacity rotary compressor as set forth in claim 1, wherein the pressure control unit comprises:

first and second flow paths communicating with the first and second compressing chambers to allow a discharging pressure to be applied to either the first or second compressing chamber, where an idle rotating operation is performed; and

first and second valves provided at the first and second flow paths to open and close the flow paths.

3. The variable capacity rotary compressor as set forth in claim 2, wherein

the pressure control unit further includes a connecting pipe provided outside the hermetic casing to communicate with an inside of the hermetic casing, and

the first and second flow paths are defined by first and second branch pipes diverging from the connecting pipe, the first and second valves being provided at the first and second branch pipes.

4. The variable capacity rotary compressor as set forth in claim 1, wherein the pressure control unit comprises:

a connecting pipe provided outside the hermetic casing to communicate with an inside of the hermetic casing;

first and second branch pipes diverging from the connecting pipe and communicating with the first and second compressing chambers; and

a three-way valve provided at a diverging point where the first and second branch pipes diverge from the connecting pipe.

5. The variable capacity rotary compressor as set forth in claim 1, wherein the housing includes an intermediate plate to isolate the first and second compressing chambers from each other, and wherein the pressure control unit comprises:

a path-diverting chamber formed in the intermediate plate and having first and second through-holes communicating with the first and second compressing chambers;

a communicating path to allow an inside of the hermetic casing to communicate with the path-diverting chamber; and

a valve piece disposed in the path-diverting chamber and operated by a pressure difference between the first and second compressing chambers to close either the first or second through-hole where a compressing operation is performed while opening the other through-hole.

6. The variable capacity rotary compressor as set forth in claim 5, wherein the communicating path comprises:

a connecting pipe extended from the hermetic casing to communicate with an inside of the hermetic casing; and

a flow path radially formed in the intermediate plate to be connected between the path-diverting chamber and the connecting pipe.

7. The variable capacity rotary compressor as set forth in claim 5, wherein the first and second through-holes of the path-diverting chamber are provided at a position opposite to the first and second vanes.

8. The variable capacity rotary compressor as set forth in claim 5, wherein diameters of the path-diverting chamber and the valve piece are larger than those of the upper and lower through-holes so as to enable the valve piece to close the upper and lower through-holes.

9. The variable capacity rotary compressor as set forth in claim 8, wherein the valve piece is made of a thin resilient plate.

10. The variable capacity rotary compressor as set forth in claim 1, further comprising a path-diverting unit to allow refrigerant to be drawn into either one of inlet ports of the first and second compressing chambers, where a compressing operation is performed.

11. The variable capacity rotary compressor as set forth in claim 10, wherein the path-diverting unit comprises:

a hollow body having a predetermined length and closed at opposite ends thereof;

an inlet opening provided at the center of the hollow body;

first and second outlet openings provided at the side opposite to the inlet opening with a spacing therebetween, and communicating with the inlet ports of the first and second compressing chambers, respectively;

a hollow valve seat disposed in the hollow body to communicate with the inlet opening and having opposite ends communicating with the first and second outlet openings; and

first and second valve members movably disposed in the hollow body to close the opposite ends of the hollow valve seat, and connected to each other by a connecting member.

12. The variable capacity rotary compressor as set forth in claim 11, wherein the first and second valve members are moved toward either the first or second outlet openings, which has a pressure lower than that of the other outlet opening, due to a pressure difference between the first and second outlet opening, so that a corresponding one of the first or second valve member closes one end of the valve seat adjacent to the other outlet opening with a higher

pressure, thereby allowing the inlet opening of the hollow body to communicate with the one outlet opening with lower pressure.

13. The variable capacity rotary compressor as set forth in claim 1, wherein each of the first and second eccentric units comprises:

an eccentric cam provided on the rotating shaft;

an eccentric bush rotatably fitted on an outer surface of the eccentric cam, a corresponding one of the first and second roller pistons being fitted on an outer surface of the eccentric bush; and

a stop unit to cause the eccentric bush to be maintained in an eccentric state .

14. The variable capacity rotary compressor as set forth in claim 13, wherein the stop unit includes a first stop element projected from the eccentric cam, and a second stop element protruded from the eccentric bush to be caught by the first stop element.

15. A variable capacity rotary compressor comprising:

a housing including first and second compressing chambers having different capacities;

a rotating shaft rotatably disposed in the first and second compressing chambers;

first and second roller pistons provided on an outer surface of the rotating shaft to be locked in an eccentric state or to be released from the eccentric state depending on a rotating direction of the rotating shaft;

first and second vanes disposed in the first and second compressing chambers to be radially moved while being in contact with the first and second roller pistons; and

a pressure control unit to allow a discharging pressure to be applied to either the first or second compressing chamber, where an idle rotating operation is performed.

16. A variable capacity rotary compressor comprising:

a hermetic casing;

a housing disposed in the hermetic casing and including first and second compressing chambers having different capacities;

a rotating shaft rotatably disposed in the first and second compressing chambers;

first and second roller pistons provided on an outer surface of the rotating shaft to be locked in an eccentric state or to be released from the eccentric state depending on a rotating direction of the rotating shaft;

first and second vanes disposed in the first and second compressing chambers to be radially moved while being in contact with the first and second roller pistons;

first and second communicating paths to allow the first and second compressing chambers to communicate with an inside of the hermetic casing; and

a valve to allow a discharging pressure to be applied to either the first or second compressing chamber, where an idle rotating operation is performed.

17. A variable capacity hermetically sealed rotary compressor, including first and second compressing chambers in which first and second compressing operations are carried out, respectively, and a fixed shaft to rotate in first and second directions in the compressing chambers, comprising:

first and second eccentric units mounted on the shaft in the first and second compressing chambers, respectively, such that when the shaft rotates in the first direction the first eccentric unit performs a first compressing operation, and when the shaft rotates in the second direction, the second eccentric unit performs a second compressing operation;

first and second roller pistons fitted on the first and second eccentric units, respectively, to rotate eccentrically when the respective eccentric unit performs the respective compressing operation and to rotate idly when the other respective eccentric unit performs the respective compressing operation; and

a pressure control unit to allow a discharging pressure to be applied to either the first or second compressing chamber, where the respective idle rotating operation is performed.

18. The compressor according to claim 17, further comprising a path diverting unit comprising:

a cylindrical hollow valve seat having both ends open;

first and second valve members movably disposed in the valve seat to open and close the cylindrical hollow valve seat; and

a connecting rod between the first and second valve members which are joined thereto.

19. The compressor according to claim 18, wherein the path diverting unit further comprises:

an inlet of a suction pipe from an accumulation chamber; and

first and second outlet openings leading to the first and second compressing chambers, respectively, wherein the valve seat is formed at the center of an outer circumferential opening thereof, to communicate with the inlet, having a length that is shorter than a length between the outlet openings.

20. The compressor according to claim 19, wherein the first and second valve plates have a diameter corresponding to an internal diameter of the hollow body to be smoothly moved in the hollow body, and have a plurality of through holes to allow air to pass therethrough.

21. The compressor according to claim 20, wherein the first and second valve members are moved toward either the first or second outlet openings, which has an internal pressure lower than the other outlet opening, thereby closing the valve seat, adjacent the other opening.

22. The compressor according to claim 17, wherein the pressure control unit comprises:

a connecting pipe outside the hermetically sealed compressor which communicates with an inside of the hermetically sealed compressor at an upper end thereof and extends downward;

first and second branch pipes diverging from the connecting pipe to communicate with the first and second compressing chambers, respectively; and

first and second valves in the first and second pipes, respectively, to block the first and second pipes.

23. The compressor according to claim 22, wherein when a compressing operation is performed in the first compressing chamber the first valve of the pressure control unit is closed while the second valve of the pressure control unit is opened, thereby allowing an internal pressure of the hermetically sealed compressor to be applied to the second compressing chamber.

24. The compressor according to claim 23, wherein when a compressing operation is performed in the second compressing chamber the second valve of the pressure control unit is closed while the first valve of the pressure control unit is opened, thereby allowing an internal pressure of the hermetically sealed compressor to be applied to the first compressing chamber.

25. The compressor according to claim 17, wherein the pressure control unit comprises:

a connecting pipe outside the hermetically sealed compressor which communicates with an inside of the hermetically sealed compressor at an upper end thereof and extends downward;

first and second branch pipes diverging from the connecting pipe to communicate with the first and second compressing chambers, respectively; and

a three way valve at the diverging point of the first and second branch pipes, to selectively block the first and second pipes.

26. The compressor according to claim 25, wherein when a compressing operation is performed in the first compressing chamber the three way valve allows the connecting pipe to communicate with the second branch pipe.

27. The compressor according to claim 26, wherein when a compressing operation is performed in the second compressing chamber the three way valve allows the connecting pipe to communicate with the first branch pipe.

28. The compressor according to claim 25, wherein the three way valve comprises an electric valve that operates in response to an electric signal.

29. The compressor according to claim 17, wherein the pressure control unit comprises:

a communicating path in an intermediate plane between the first and second compressing chambers, including a path diverting chamber having upper and lower through holes to communicate with the first and second compressing chambers;

a flow path radially formed in the intermediate plane to communicate with the path diverting chamber; and

a connecting pipe to allow the path diverting chamber to communicate with the inside of the hermetically sealed compressor.

30. A variable capacity hermetically sealed rotary compressor, comprising:

first and second compressing chambers, in which one of a first set of a first compressing operation and a second idling operation are performed, and second set of a first idling operation and a second compressing operation are performed, respectively;

a shaft to rotate in first and second directions to selectively induce the respective first and second compressing operations and the first and second idling operations,

a pressure control unit to apply a discharging pressure to either the first or second compressing chamber, where the respective idle rotating operation is performed.